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A NEW SPECIES OF EXOTIC *PONERA* FROM NORTH CAROLINA (HYMENOPTERA, FORMICIDAE)

By Marion R. Smith

D. L. Wray of the North Carolina Department of Agriculture in 1959 collected a most unusual species of *Ponera* in a wooded area near Acre, Beaufort County, North Carolina. The specimens were taken from leaf mold with a Berlese funnel. This species differed from all North American species of *Ponera* in its small size, slender body, unusually short and thick antennae, and an almost complete lack of eyes. Because I had an insufficient number of specimens and because *Ponera* is a very large and cosmopolitan genus containing many species with very subtle characters, I was discouraged from trying to name the individuals specifically. Then in 1960 I received 12 lots containing 177 specimens (workers and females) of this species collected (1958–1960) by Professor W. G. Carter of Washington and Lee University. He collected them with a Berlese funnel from leaf mold and litter from a number of diverse habitats in six other counties in North Carolina (see detailed notes below). This additional material enabled me to place the species in the *Ponera tenuis* group of Wilson (1957, Bull. Mus. Compar. Zool., Harvard Univ. 116: 358–361) and nearest *tenuis*.

All species of the *tenuis* group known to me are exotic and *tenuis* itself was originally described from New Guinea. It seems, therefore, there should be little doubt that this new species was introduced. The very small size and cryptobiotic habits of these ants make easy their unwitting spread by man. It is my opinion that the ants were probably introduced into North Carolina by the Armed Services during World War II or shortly thereafter. The ability of this species to live in diverse habitats where temperature, moisture, ground cover, and soil texture vary greatly undoubtedly accounts for its becoming so easily established.

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Ponera exotica, n. sp.

Holotype worker. (Fig. 1, A and B)

Slender, extremely small, 2 mm. in length. HW 0.40 mm., HL 0.50 mm., SL 0.32 mm., CI 80, SI 80, PW 0.29 mm., PNL 0.16 mm., DPW 0.23 mm., PH 0.30 mm. Head narrow, subrectangular, with weakly convex, almost subparallel sides and distinctly emarginate posterior border. Antenna remarkably short and thick; scape when fully extended lacking slightly more than its greatest width of attaining the posterior border of the head; all funicular segments except the first and last distinctly wider than long, antennal club massive, 4-segmented, approximately twice the length of the remainder of the funiculus. Eyes extremely small, almost indiscernible, and containing two ommatidia. Apex of mandible with three distinct teeth followed by a row of basal denticules too small to count or describe but which appear to be of approximately the same size. Thorax widest in the prothorax, apparently narrowest at the mesoepinotal suture, the suture more distinct in some lights than others, epinotum from above appearing compressed and with subparallel borders. In profile, dorsal surface of thorax meeting the epinotal declivity in a rounded angle. Petiolar node in profile, thick, subrectangular, but narrowed somewhat toward the summit of the node; from above the outline of the petiolar node about equal to or not greater than half a circle.

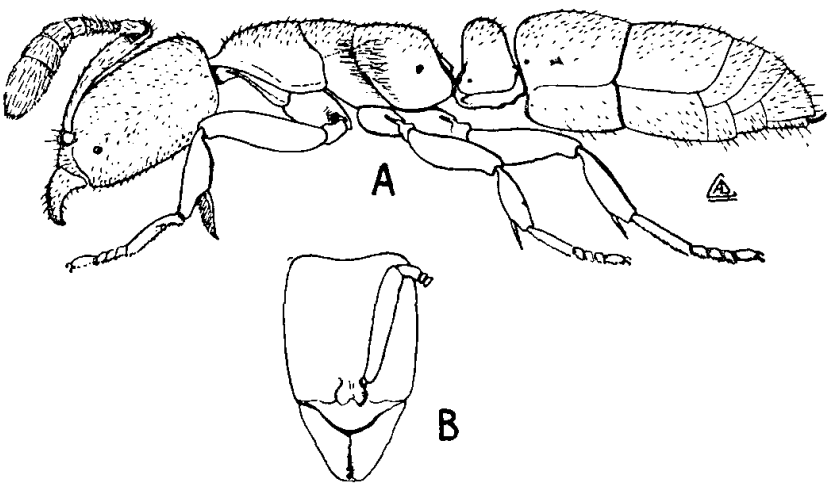

Fig. 1. *Ponera exotica,* n. sp.
A. Profile view of body of worker.
B. Frontal view of head of worker.

Mandible smooth, shiny, remainder of body finely punctulate, the head appearing to be the finest and most densely punctulate of the body sections. The body subopaque to shiny according to certain lights or positions in which the body is held.

Body hairs extremely short, longest and most noticeable on the dorsal and ventral surfaces of the anterior part of the head, the dorsum of the petiolar node, and the dorsal and ventral surfaces of the apical portion of the gaster.

Body a rather uniform light brown or brown depending upon the light, the appendages scarcely paler.

Female paratypes.

Of approximately the same length as the holotype worker but with a slightly stouter body. Eye well developed, 0.10 mm. in its greatest diameter and with approximately 8 ommatidia in that diameter. Apex of scape scarcely surpassing the anterior ocellus when the scape is fully extended posteriorly; funicular club not so suddenly enlarged or so strongly thickened as in the worker. Petiolar node in profile more slender (anteroposteriorly), gradually narrowing from the base to the summit of the node. Anterior wing with the following cells: A discoidal, two cubital and a radial. Stigma well developed. Color and pilosity similar to that of the worker. Measurements were made of two alate females, one of these had the following: HW 0.42 mm., HL 0.52 mm., SL 0.34 mm., CI 81, SI 81, PW 0.35 mm., PNL 0.17 mm., DPW 0.25 mm., PH 0.30 mm. The other had similar measurements except that the PH was 0.32 mm.

Type locality—Croatan National Forest, 2 miles east of Croatan, Craven County, North Carolina; Aug. 20, 1960, W. G. Carter (Carter Collection No. 11).

Described from a holotype and 28 paratype workers and 4 paratype females, one of the latter dealate. The holotype and 23 paratypes will be placed in the U. S. National Museum under U. S. N. M. No. *65915* and 9 paratypes will be deposited in the Museum of Comparative Zoology, Cambridge, Massachusetts.

Thirteen workers measured for variation in body proportions gave the following figures: HW 0.37 mm.–0.40 mm. (0.38 mm.), HL 0.37 mm.–0.50 mm. (0.45 mm.), SL 0.28 mm.–0.32 mm. (0.30 mm.), CI 79–83 (82), SI 75–80 (78), PW 0.26 mm.–0.29 mm. (0.28 mm.), PNL 0.15 mm.–0.17 mm. (0.16 mm.), DPW 0.20 mm.–0.23 mm. (0.21 mm.), PH 0.27 mm.–0.30 mm. (0.28 mm.). The figures enclosed in parentheses refer to average measurements.

In the key to *Ponera* of the *tenuis* group (Wilson 1957, pps. 359–361), the new species will key out to couplet 9 which contains the species *huonica* Wilson and *tenuis* (Emery). To reach this couplet the worker must possess the following characters: Presence of eyes (although vestigial), HW greater than 0.34 mm., CI greater than 76, DPW greater than 0.15 mm., and a distinct 4-segmented antennal club. From both *huonica* and *tenuis*, *exotica* is distinguished by its smaller size, HW 0.37 mm. to 0.40 mm., the distinct and narrowly impressed mesoepinotal suture and lighter color (light brown or yellowish brown). The sculpturing, particularly that of the head, is less dense and the body surface less opaque than in either *huonica* or *tenuis*.

The following collections were available for study. Those numbered from 1 through 12 were collected by W. C. Carter and that numbered 13 was collected by D. L. Wray. The data below are virtually the same as those submitted by the collectors except for minor changes in arrangement to attain uniformity. The number of individuals listed for each collection does not necessarily represent the total number secured as often the collectors retained specimens.

Piedmont

1—Aug. 5, 1958. Alongside Hwy. 70, approximately 6 miles west of Hillsboro, Orange Co., N. C. Collection made in a post oak-blackjack oak-hickory stand. The forest stand at the collection site was open and sunny with clumps of grass common.

The leaf litter was not deep and the soil was a thin, dry, hard, yellowish-white clay. The site was not as xeric as the other Piedmont locality but could still be considered a dry, open forest. The collection was made by Berlese funnel from dry litter and soil. 27 workers.

2—Sept. 5, 1960. Alongside Hwy. 74, near Indian Trail, Union Co., N. C., midway between Charlotte and Monroe. Collection made from post oak-blackjack oak stand which was very open, sunny, and dry. The soil was a thin, hard, dry, yellowish-white clay (characteristic of many Piedmont scrub oak stands), and the leaf mold and litter were thin and scanty. Open areas were covered with a well-developed stand of grass clumps and no areas were deeply shaded. The whole site was definitely xeric in aspect. The collection was made from soil and litter of oak leaves and pine needles. 1 female, 29 workers.

3—Sept. 5, 1960. Same stand and situation as Number 2 above. 21 workers, 2 females. Ants present with the new *Ponera* in the scrub oak stands such as described above for Numbers 2 and 3 were: *Aphaenogaster lamellidens* Mayr, *A. treatae* For., *Crematogaster ashmeadi* Mayr, *C. clara* Mayr, *C. lineolata* (Say), *Tapinoma sessile* (Say), *Myrmecina americana* Em., *Pheidole dentata* Mayr, *Formica difficilis* Em., *F. schaufussi* Mayr, *F. pallidefulva nitidiventris* Em., *Leptothorax curvispinosus* Mayr, *L. pergandei floridanus* Em., *Ponera coarctata pennsylvanica* (Buckl.), *Stigmatoma pallipes* (Hald.), *Sysphincta pergandei* Em., *Solenopsis* (*Diplorhoptrum*) sp., *Smithistruma ornata* (Mayr), *Iridomyrmex pruinosus* (Rog.), *Lasius alienus* (Foerster), *Acanthomyops claviger* (Rog.), *Camponotus castaneus* (Latr.).

Coastal Plain

4—June 16, 1960. Croatan Natl. Forest, off Hwy. 70 in the vicinity of Flanner's Beach on the Neuse River, 2 miles east of Croatan, Craven Co., N. C. The collection was obtained from deep loblolly pine-hardwood leaf litter from around a decayed log. Beech trees were common in the collection area and the soil surface was deeply shaded. The forest, however, was not dense and nearly impenetrable as some Coastal Plain forests are. The soil was a sandy loam characteristic of the lower Coastal Plain. The collection was made with a Berlese funnel. 22 workers, 2 females.

5—June 16, 1960. Same forest and situation as Number 4 above. Collection made with a Berlese funnel. 7 females.

6—June 18, 1960. Alongside Hwy. 70, several miles north-west of Havelock, Craven Co., N. C. Collection obtained from deep beech-hardwood leaf mold and litter gathered from around the base of a single beech tree. The surrounding forest was of oaks, hickories, and loblolly pines. The stand was well shaded but not dense at the collection area. The soil was a sandy loam. The collection was made with a Berlese funnel. 21 workers.

7—June 18, 1960. The same site as Number 6 above. The collection was made with a Berlese funnel. 9 workers.

8—June 20, 1960. In the same Flanner's Beach forest as Numbers 4 and 5 above. Collection made in a loblolly pine-hardwood section of the forest where beech trees were much less common. The forest was well shaded but not dense and the soil a sandy loam. The collection was made with a Berlese funnel from deep pine and

hardwood leaf mold, litter, and underlying soil. 12 workers.

9–June 25, 1960. Alongside Hwy. 117, between Faison and Calypso in Duplin Co., N. C. Collection made in a very dense stand of pine and undergrowth that was well shaded. The pine-hardwood leaf mold and litter were gathered from around the base of a dogwood and pine tree which were very close together. The leaf mold was very deep and the underlying soil a moist, sandy loam. The collection was made with a Berlese funnel. 12 workers.

10—July 25, 1960. Collection made in New Hanover Co., N. C., in a forest that extended along a paved country road on the mainland east of Wilmington and south of Wrightsville Beach, parallel to the Sound. The forest was of dense and well-shaded loblolly pine with a well-developed hardwood understory. The collection was made with a Berlese funnel from deep pine and hardwood leaf mold at the base of some trees and rotten pine stumps. The soil was a moist, sandy loam. 6 workers.

11—Aug. 20, 1960. Collection made in the Flanner's Beach forest mentioned in Numbers 4, 5, and 8 above. The collection came from beech-pine-hardwood leaf litter and mold. A creek swamp runs through this forest and empties into the Neuse River. The stream has developed a lower bottomland with a cypress-gum forest. This bottomland is bounded by fairly steep slopes and by ravines that lead into the bottomland area. The slopes of the lowland and the ravines are covered with a stand of beech, hardwoods, and a few pines. The higher ground supports a forest of loblolly pine and hardwoods. The collection was made with Berlese funnels in the beech stands of the ravine slope. 29 workers, 4 females.

12—Aug. 1, 1960. Alongside Hwy. 70, about 4 miles south of Newbern, in Craven Co., N. C. Collection obtained from oak-pine leaf mold and litter in an oak-pine forest. This forest was well shaded but not dense. The leaf mold was moderately deep and the soil a sandy loam. The collection was made with a Berlese funnel. 6 workers.

13—Sept. 20, 1950. Alongside Hwy. between Acre and Washington, Beaufort Co., N. C., 1 mile west of Acre and 16 miles east of Washington. Collection made from a heavily wooded area. The forest was a mixture of pine and hardwoods, mostly gum, poplar and some oaks. The woods were near a swamp. The collection was made by Berlese funnel from leaf mold. 2 workers.

The most abundant species noted as surface foragers in the Coastal Plain forests were *Aphaenogaster rudis* Em., *A.* sp., and *Lasius alienus* (Foerster). The species characteristic of the leaf mold-litter-soil samples for the Berlese funnel in which the new *Ponera* sp. was found were *Ponera coarctata pennsylvanica* (Buckl.), *P. trigona opacior* For., *Stigmatomma pallipes* (Hald.), *Proceratium silaceum* Rog., *Discothyrea testacea* Rog., *Leptothroax tuscaloosae* Wilson, *Solenopsis* (*Diplorhoptrum*) sp., *Myrmecina americana* Em., *Strumigenys louisianae* Rog., *Smithistruma pergandei* (Em.), *Sm. ornata* (Mayr), *Sm. ohioensis* (K. and S.), *Sm. rostrata* (Em.), *Pheidole dentigula* M. R. Sm., *Brachymyrmex depilis* Em., *Lasius flavus* (F.), *L. umbratus* (Nyl.), and *Paratrechina* (*Nylanderia*) sp.

In summarizing it should be noted that the Piedmont collections were from definitely dry, open sites with relatively thin leaf mold and litter, whereas the Coastal Plains forest collections were from decidedly mesic and well-shaded habitats where there was a good accumulation of leaf mold and litter.

I am indebted to Robert W. Taylor and E. O. Wilson, Biological Laboratories, Harvard University, for time spent in confirming my determination of this specics as new and again to Mr. Taylor especially for furnishing valuable measurements. The illustrations were made by Arthur D. Cushman.

The terminology and methods of measurements used in this paper are the same as those used by Wilson, 1957, pp. 357–358.